

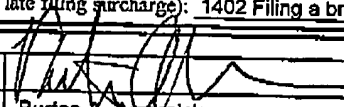
RECEIVED  
CENTRAL FAX CENTER

MAY 24 2006

PTO/SB/17 (12-04v2)

Approved for use through 7/31/2006, OMB 0851-0032  
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no person are required to respond to a collection of information unless it displays a valid OMB control number.

Effective on 12/08/2004, Fee pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).			Complete if Known				
<b>FEE TRANSMITTAL</b> <b>For FY 2005</b>			Application Number	10/697,014-Conf. #8234			
			Filing Date	October 31, 2003			
			First Named Inventor	Maria Ronay			
			Examiner Name	J. C. Morillo			
			Art Unit	1742			
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27			Attorney Docket No.	YOR920030204US1			
<b>TOTAL AMOUNT OF PAYMENT</b> (\$) 500.00							
<b>METHOD OF PAYMENT</b> (check all that apply)							
<input type="checkbox"/> Check <input type="checkbox"/> Credit Card <input type="checkbox"/> Money Order <input type="checkbox"/> None <input type="checkbox"/> Other (please identify):							
<input checked="" type="checkbox"/> Deposit Account Deposit Account Number: 50-0510 Deposit Account Name: IBM Corporation (Yorktown)							
For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)							
<input checked="" type="checkbox"/> Charge fee(s) indicated below							
<input type="checkbox"/> Charge fee(s) indicated below, except for the filing fee							
<input checked="" type="checkbox"/> Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17							
<input checked="" type="checkbox"/> Credit any overpayments							
<b>FEE CALCULATION</b>							
<b>1. BASIC FILING, SEARCH, AND EXAMINATION FEES</b>							
	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fees Paid (\$)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	
<b>2. EXCESS CLAIM FEES</b>							
<b>Fee Description</b>					<b>Small Entity Fee (\$)</b>		
Each claim over 20 (including Reissues)					50		
Each independent claim over 3 (including Reissues)					25		
Multiple dependent claims					200		
					360		
<b>Total Claims</b> <u>29</u> - <u>29</u> = <u>0</u> x <u>0</u> = <u>0</u>					<b>Multiple Dependent Claims</b>		
					<b>Fee (\$)</b> <b>Fee Paid (\$)</b>		
<b>Indep. Claims</b> <u>9</u> - <u>9</u> = <u>0</u> x <u>0</u> = <u>0</u>							
					<b>Fee (\$)</b> <b>Fee Paid (\$)</b>		
<b>3. APPLICATION SIZE FEE</b>							
If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							
<b>Total Sheets</b> <u>100</u> - <u>100</u> = <u>0</u> / <u>50</u> = <u>0</u> (round up to a whole number) x <u>0</u>		<b>Extra Sheets</b>		<b>Number of each additional 50 or fraction thereof</b>		<b>Fee (\$)</b> <b>Fee Paid (\$)</b>	
					<b>Non-English Specification, \$130 fee (no small entity discount)</b>		
					<b>Other (e.g., late filing surcharge): 1402 Filing a brief in support of an appeal</b>		
					<b>Fees Paid (\$)</b> 500.00		
<b>SUBMITTED BY</b>							
<b>Signature</b> 		<b>Registration No. (Attorney/Agent)</b> 24,852		<b>Telephone</b> (202) 331-7111		<b>Date</b> May 24, 2006	
<b>Name (Print/Type)</b> Burton A. Amernick							

**RECEIVED  
CENTRAL FAX CENTER****MAY 24 2006****FAX TRANSMISSION****DATE:** May 24, 2006**PTO IDENTIFIER:** Application Number 10/697,014-Conf. #8234  
Patent Number**Inventor:** Maria Ronay**MESSAGE TO:** US Patent and Trademark Office**FAX NUMBER:** (571) 273-8300**FROM:** CONNOLLY BOVE LODGE & HUTZ LLP  
Burton A. Amernick**PHONE:** (202) 331-7111**Attorney Dkt. #:** YOR920030204US1**PAGES (including Cover Sheet):** 15**CONTENTS:** Fee Transmittal (1 page)  
Appeal Brief Transmittal (1 page)  
Appeal Brief (11 pages)  
Charge \$500.00 to deposit account 50-0510  
Certificate of Transmission (1 page)

If your receipt of this transmission is in error, please notify this firm immediately by collect call to sender at (202) 331-7111 and send the original transmission to us by return mail at the address below.

This transmission is intended for the sole use of the individual and entity to whom it is addressed, and may contain information that is privileged, confidential and exempt from disclosure under applicable law. You are hereby notified that any dissemination, distribution or duplication of this transmission by someone other than the intended addressee or its designated agent is strictly prohibited.

**CONNOLLY BOVE LODGE & HUTZ LLP**  
1990 M Street, N.W., Suite 800, Washington, DC 20036  
Telephone: (202) 331-7111 Facsimile:

PTO/SB/97 (09-04)  
Approved for use through 07/31/2008. OMB 0651-0031  
U. S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE  
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Application No. (if known): 10/697,014

Attorney Docket No.: YOR920030204US1

## Certificate of Transmission under 37 CFR 1.8

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office.

on May 24, 2006  
Date

  
Signature

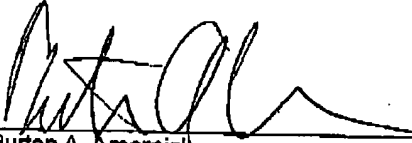
Nicole Brown  
Typed or printed name of person signing Certificate

Registration Number, if applicable

Telephone Number

Note: Each paper must have its own certificate of transmission, or this certificate must identify each submitted paper.

Fee Transmittal (1 page)  
Appeal Brief Transmittal (1 page)  
Appeal Brief (11 pages)  
Charge \$500.00 to deposit account 60-0510

TRANSMITTAL OF APPEAL BRIEF		Docket No. YOR920030204US1	
In re Application of: Maria Ronay			
Application No. 10/697,014-Conf. #8234	Filing Date October 31, 2003	Examiner J. C. Morillo	Group Art Unit 1742
Invention: SELF-ENCAPSULATED SILVER ALLOYS FOR INTERCONNECTS			
<b><u>TO THE COMMISSIONER OF PATENTS:</u></b>			
Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: <u>March 24, 2006</u>			
The fee for filing this Appeal Brief is <u>\$ 500.00</u>			
<input checked="" type="checkbox"/> Large Entity <input type="checkbox"/> Small Entity			
<input type="checkbox"/> A petition for extension of time is also enclosed.			
The fee for the extension of time is _____			
<input type="checkbox"/> A check in the amount of _____ is enclosed.			
<input checked="" type="checkbox"/> Charge the amount of the fee to Deposit Account No. <u>50-0510</u> This sheet is submitted in duplicate.			
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.			
<input checked="" type="checkbox"/> The Director is hereby authorized to charge any additional fees that may be required or credit any overpayment to Deposit Account No. <u>50-0510</u> This sheet is submitted in duplicate.			
		Dated: <u>May 24, 2006</u>	
Burton A. Amernick Attorney Reg. No. : 24,852 CONNOLLY BOVE LODGE & HUTZ LLP 1990 M Street, N.W., Suite 800 Washington, DC 20036 (202) 331-7111			
I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted by facsimile to the Patent and Trademark Office, facsimile no. (571) 273-8300, on the date shown below.			
Dated: _____		Signature: _____ (Burton A. Amernick)	

465597

RECEIVED  
CENTRAL FAX CENTER

MAY 24 2006

Docket No.: YOR920030204US1  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Maria Ronay

Application No.: 10/697,014

Confirmation No.: 8234

Filed: October 31, 2003

Art Unit: 1742

For: SELF-ENCAPSULATED SILVER ALLOYS  
FOR INTERCONNECTS

Examiner: J. C. Morillo

**APPEAL BRIEF**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed within two months of the Notice of Appeal filed in this case on March 24, 2006, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

- |       |   |
|-------|---|
| I.    | Real Party In Interest                        |
| II    | Related Appeals and Interferences             |
| III.  | Status of Claims                              |
| IV.   | Status of Amendments                          |
| V.    | Summary of Claimed Subject Matter             |
| VI.   | Grounds of Rejection to be Reviewed on Appeal |
| VII.  | Argument                                      |
| VIII. | Claims  |

Application No.: 10/697,014

Docket No.: YOR920030204US1

IX. Evidence  
X. Related Proceedings  
Appendix A Claims

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

International Business Machines Corporation

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 35 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 1-8, 11, 12 and 30
2. Claims withdrawn from consideration but not canceled: 13-39
3. Claims pending: 9, 10, 13-29 and 31-35
4. Claims allowed: 0
5. Claims rejected: 9, 10 and 31-35

C. Claims On Appeal

The claims on appeal are claims 9, 10 and 31-35

Application No.: 10/697,014

Docket No.: YOR920030204US1

#### IV. STATUS OF AMENDMENTS

Applicant did not file an Amendment After Final Rejection.

#### V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention addresses problems of oxidation and/or sulphidation of silver. In particular, according to the present invention the oxidation and/or sulphidation resistance of silver is improved by alloying with certain types of alloying elements. See page 2, lines 15-17 of the specification.

In particular the present invention, as recited in independent claim 9, relates to an electronic structure comprising

a dielectric layer having a substantially planar upper surface and having a pattern of recesses therein, (see page 3, lines 1-3 of the specification)

and an alloy being located in recesses wherein said alloy is an alloy of silver (see page 6, line 3 of the specification) and beryllium (see page 3, line 14 of the specification), wherein the amount of beryllium is about 0.2 to about 5% by weight (see page 3, lines 15-16 of the specification) and a layer of beryllium oxide of about 1 to about 10 nanometers on the alloy (see page 6, lines 10-13 and page 12, original claim 6).

The oxide typically has a relatively low dielectric constant so as not to cause significant capacitance increase and also typically has excellent heat conductivity. See page 6, lines 11-13 of the specification.

According to claim 10 the alloy is present at the back end of the line (BEOL) of the structure. See page 8, line 16; page 9, lines 1, 5 and 10 of the specification and claim 13, original claim 10.

According to claim 31, the alloy consists essentially of silver and beryllium (see page 6, lines 14-18 of the specification).

According to claims 32 and 34, the amount of beryllium is about 0.2 to about 3% by weight; and according to claims 33 and 35, the amount of beryllium is about 0.2 to about 2% by weight (see page 6, lines 15-18 of the specification).

Application No.: 10/697,014

Docket No.: YOR920030204US1

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Has the examiner established that Claims 9, 10 and 31-35 are obvious and therefore unpatentable under 35 USC 103(a) over the cited art and namely over U.S. Patent 2,196,307 to Hensel in view of U.S. Patent 4,775,511 to Kono or U.S. Patent 6,412,628 to Tramposch or U.S. Patent 5,023,144 to Yamamoto?

## VII. ARGUMENT

A. The applied references fail to render obvious claims 9, 10 and 31-35

Claims 9, 10 and 31-35 were rejected under 35 USC 103(a) as being unpatentable over U.S. Patent 2,196,307 to Hensel in view of U.S. Patent 4,775,511 to Kono or U.S. Patent 6,412,628 to Tramposch or U.S. Patent 5,023,144 to Yamamoto. The cited references do not render obvious the above claims.

Hensel does not suggest the invention as defined in the above claims since, among other things, Hensel fails to suggest an electronic structure that comprises a dielectric layer having a substantially planar upper surface and having a pattern of recesses therein, and an alloy being located in recesses. Moreover, Hensel fails to suggest forming an oxide layer of the alloying metal on the recited alloy.

Kono was relied on for teaching the formation of a film of stable Be-oxide on the surface of silver alloys to prevent corrosion/tarnishing. Kono does not overcome the above discussed deficiencies of Hensel with respect to rendering unpatentable the above claims since, among other things, Kono fails to even remotely suggest an oxide layer of about 1 to about 10 nanometers as recited in the claims. As discussed in the present specification, providing a relatively thin, e.g., about 2 to about 10 nanometers, oxide layer, significant capacitance increase is not caused by the layer. See page 6, lines 9-13 of the specification.

Moreover, nothing in Kono would suggest employing a thin layer. Furthermore, Kono actually teaches away from the invention of the above claims, since Kono explicitly states that oxides have disadvantages, and therefore, suggests using, instead, certain alloys. For instance at column 1, line 45 et seq. Kono states:



Application No.: 10/697,014

Docket No.: YOR920030204US1

"However, it was found that main disadvantages of those methods is that accidental scratch will expose the fresh silver surface and therefore initiate the tarnishing process."

Furthermore, Kono fails to even remotely suggest a structure that comprises a dielectric layer having a substantially planar upper surface and having a pattern of recesses therein, and an alloy being located in recesses.

Tramposch was relied upon for a disclosure that a beryllium oxide layer can be formed on an otherwise easily corroded silver electrical contact in order to prevent or inhibit the formation of tarnish. Tramposch does not overcome the above discussed deficiencies of the above references with respect to rendering unpatentable the above claims since, among other things, Tramposch fails to even remotely suggest an oxide layer of about 1 to about 10 nanometers as recited in the claims. As discussed in the present specification, providing a relatively thin, e.g., about 2 to about 10 nanometers, oxide layer, significant capacitance increase is not caused by the layer. See page 6, lines 9-13 of the specification. Also, the oxide layer typically has excellent heat conductivity. Moreover, nothing in Tramposch would suggest employing a thin layer.

Furthermore, Tramposch actually teaches away from the invention of the above claims, since Tramposch explicitly states that oxides have disadvantages, and therefore, suggests using, instead, flexible absorbent articles. For instance at column 2, lines 1-5 Tramposch states:

"However, all of these methods have disadvantages. Chemical treatment and polishing gradually remove part of the original metal. Accidental scratches in the film of stable metal or oxides expose the fresh silver or copper surface to attack by hydrogen sulfide."

Furthermore, Tramposch fails to even remotely suggest a structure that comprises a dielectric layer having a substantially planar upper surface and having a pattern of recesses therein, and an alloy being located in recesses.

Yamamoto was relied upon for teaching that an oxidized film of (BeO) forms easily for Ag alloys containing small amounts of Be. Yamamoto does not overcome the above discussed deficiencies of the above references with respect to rendering unpatentable the above claims since, among other things, Yamamoto teaches away from employing an alloy of Ag and Be wherein the amount of Be is about 0.2% to about 5% by weight and fails to even remotely

Application No.: 10/697,014

Docket No.: YOR920030204US1

suggest an oxide layer of about 1 to about 10 nanometers as recited in the claims and, in fact, also teaches away from such a film. For instance, see column 1, line 68 to column 2, line 5 which states:

"In contrast, if the content exceeds 750 ppm, the conductivity deteriorates abruptly. In addition, since the oxide oxidized film tends to easily form, it is very difficult to carry out spot welding. Furthermore, it becomes difficult to work the foil due to its unduly increased hardness."

The maximum amount of Be suggested by Yamamoto is significantly less than that employed according to the present invention. Using the amounts employed in the present invention would be contrary to and defeat the purposes of Yamamoto.

In addition, Yamamoto is not even concerned with the type of structure that is the subject of the present invention and not concerned with the problems addressed by the present invention. Yamamoto relates to an interconnector for a solar cell employed in satellites that is less susceptible to softening when the solar cell is exposed to temperature cycling. Accordingly, Yamamoto fails to even remotely suggest a structure that comprises a dielectric layer having a substantially planar upper surface and having a pattern of recesses therein, and an alloy being located in recesses.

The cited art is even more remote with respect to claim 31 that recite "consisting essentially of." In reciting "consists essentially of" claim 31 excludes the presence of alloying metals such as lithium as required by Hensel in amounts that would materially change the basic characteristics of the claimed invention. See MPEP 2111.03.

The mere fact that cited art may be modified in the manner suggested in the Office Action does not make this modification obvious, unless the cited art suggest the desirability of the modification. No such suggestion appears in the cited art in this matter. The Examiner's attention is kindly directed to *In re Lee* 61 USPQ2d 1430 (Fed. Cir. 2002) *In re Dembiczak et al.* 50 USPQ2d. 1614 (Fed. Cir. 1999), *In re Gordon*, 221 USPQ 1125 (Fed. Cir. 1984), *In re Laskowski*, 10 USPQ2d. 1397 (Fed. Cir. 1989) and *In re Fritch*, 23, USPQ2d. 1780 (Fed. Cir. 1992).

In *Dembiczak et al.*, supra, the Court at 1617 stated: "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. See, e.g., *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d. 1340, 1352, 48 USPQ2d. 1225,

Application No.: 10/697,014

Docket No.: YOR920030204US1

1232 (Fed. Cir. 1998) (describing 'teaching or suggestion motivation [to combine]' as in 'essential evidentiary component of an obviousness holding'), *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d. 1453, 1459 (Fed. Cir. 1998) ('the Board must identify specifically...the reasons one of ordinary skill in the art would have been motivated to select the references and combine them');...".

All of the teachings of the prior art must be considered including the negative teachings that lead away from the claimed invention as discussed above. See *In re Mercier*, 185 USPQ 774 (CCPA, 1975). Also, in the present case, the cited art lacks the necessary direction or incentive to those of ordinary skill in the art to render the rejection under 35 USC 103 sustainable. The cited art fails to provide the cited degree of predictability of success of achieving the properties attainable by the present invention needed to sustain a rejection under 35 USC 103. See *Diversitech Corp. v. Century Steps, Inc.* 7 USPQ2d 1315 (Fed. Cir. 1988), *In re Mercier*, 185 USPQ 774 (CCPA 1975) and *In re Naylor*, 152 USPQ 106 (CCPA 1966).

Moreover, the properties of the subject matter and improvements which are inherent in the claimed subject matter and disclosed in the specification are to be considered when evaluating the question of obviousness under 35 USC 103. See *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d. 1923 (Fed. Cir. 1990), *In re Antonie*, 195, USPQ 6 (CCPA 1977), *In re Estes*, 164 USPQ (CCPA 1970), and *In re Papesch*, 137 USPQ 43 (CCPA 1963).

No property can be ignored in determining patentability and comparing the claimed invention to the cited art. Along these lines, see *In re Papesch*, supra, *In re Burt et al*, 148 USPQ 548 (CCPA 1966), *In re Ward*, 141 USPQ 227 (CCPA 1964), and *In re Cescon*, 177 USPQ 264 (CCPA 1973).

Moreover, the examiner's reliance upon inherency to prop up the rejection is misplaced in that the examiner has combined four separate references and even then fails to show each and every claim recitation such as the thickness of the oxide layer. This thickness is important in avoiding significant increase in the capacitance while achieving the desired benefits from the oxide layer.

## VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A do include the amendments filed by Applicant on September 14, 2005.

Application No.: 10/697,014

Docket No.: YOR920030204US1

IX. EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

X. RELATED PROCEEDINGS

No related proceedings are referenced in II. above, or copies of decisions in related proceedings are not provided, hence no Appendix is included.

Dated: May 24, 2006

Respectfully submitted,

By 

Burton A. Amernick

Registration No.: 24,852

CONNOLLY BOVE LODGE & HUTZ LLP

1990 M Street, N.W., Suite 800

Washington, DC 20036

(202) 331-7111 (Fax)

Attorney for Applicant

Application No.: 10/697,014

Docket No.: YOR920030204US1

**APPENDIX A****Claims Involved in the Appeal of Application Serial No. 10/697,014**

9. An electronic structure comprising  
a dielectric layer having a substantially planar upper surface and having a pattern of recesses therein,  
and an alloy being located in recesses wherein said alloy is an alloy of silver and beryllium, wherein the amount of beryllium is about 0.2 to about 5% by weight and a layer of beryllium oxide of about 1 to about 10 nanometers on the alloy.
10. The electronic structure of claim 9 wherein the alloy is present at the back end of the line (BEOL) of the structure.
31. The electronic structure of claim 9, wherein said alloy consists essentially of silver and beryllium.
32. The electronic structure of claim 30, wherein the amount of beryllium is about 0.2 to about 3% by weight.
33. The electronic structure of claim 30, wherein the amount of beryllium is about 0.2 to about 2% by weight.
34. The electronic structure of claim 9, wherein the amount of beryllium is about 0.2 to about 3% by weight.
35. The electronic structure of claim 9, wherein the amount of beryllium is about 0.2 to about 2% by weight.

Application No.: 10/697,014

Docket No.: YOR920030204US1

Appendix B

EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted. Therefore there is no Appendix B.

Application No.: 10/697,014

Docket No.: YOR920030204US1

Appendix C

RELATED PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Therefore, there is no Appendix C.